

**THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

OYSTER OPTICS, LLC, §
§
Plaintiff, §
§
v. § Case No. 2:20-cv-211-JRG
§
CISCO SYSTEMS, INC., §
§
Defendant. §

CLAIM CONSTRUCTION MEMORANDUM AND ORDER

Before the Court are the Opening Claim Construction Brief (Dkt. No. 61) filed by Plaintiff Oyster Optics, LLC (“Plaintiff” or “Oyster”), the Responsive Claim Construction Brief (Dkt. No. 62) filed by Defendant Cisco Systems, Inc. (“Defendant” or “Cisco”), and Plaintiff’s Reply (Dkt. No. 63). On April 23, 2021, the Court held a hearing to determine the proper construction of disputed terms in U.S. Pat. Nos. 6,665,500, 8,913,898, and 10,205,516. Having reviewed the arguments made by the parties at the hearing and claim construction briefing, considered the intrinsic evidence, and making subsidiary factual findings about the extrinsic evidence, the Court hereby issues this Claim Construction Memorandum and Order. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005) (en banc); *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015).

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I. BACKGROUND

Plaintiff alleges infringement of U.S. Pat. Nos. 6,665,500 (“the 500 Patent”), 8,913,898 (“the ’898 Patent”), and 10,205,516 (“the ’516 Patent”) (collectively, the “patents-in-suit”). Dkt. Nos. 61-2, 61-3, 61-4. The patents-in-suit relate to optical telecommunications. *See* Dkt. No. 61 at 4–7.

The ’500 Patent, titled “Dual-Mode Fiber Optic Telecommunications System and Method,” bears a filing date of January 29, 2001 and issued on December 16, 2003. The Abstract of the ’500 Patent states:

An optical data transmitter includes at least one light source, a phase modulator for phase modulating light from the light source, and a controller having an input for receiving an electronic data stream, the controller in a first mode controlling the phase modulator so as to create phase-modulated optical signals in the light as a function of the electronic data stream and the controller in a second alternate mode amplitude-modulating the light as a function of the electronic data stream. A dual-mode receiver, an optical data transmission system and a dual-mode optical signal are also disclosed.

The '898 Patent, titled "Fiber Optic Telecommunications Card with Security Detection," bears a priority date of July 9, 2001 and issued on December 16, 2014. The '516 Patent, titled "Fiber Optic Telecommunications Card with Energy Level Monitoring," bears a priority date of July 9, 2001 and issued on February 12, 2019. The Abstracts of the '898 Patent and the '516 Patent are the same and state:

A transceiver card for a telecommunications box for transmitting data over a first optical fiber and receiving data over a second optical fiber. The card has transmitter for transmitting data over the first optical fiber, the transmitter having a laser and a modulator, a fiber output optically connected to the laser for connecting the first optical fiber to the card, a fiber input for connecting the second optical fiber to the card, a receiver optically connected to the fiber input for receiving data from the second optical fiber, and an OTDR optically connected between the transmitter and the fiber output or between the receiver and the fiber input. An energy level detector is also provided between the receiver and the fiber input.

This Court and the Northern District of California have previously construed disputed terms in the patents-in-suit (among other patents):

Oyster Optics, LLC v. Coriant America Inc., et al., No. 2:16-CV-1302, Dkt. No. 190 (E.D. Tex. Dec. 5, 2017) (Gilstrap, J.) (Claim Construction Memorandum and Order construing "phase modulation" (among other terms) in the '898 Patent) ("Coriant");

Oyster Optics, LLC v. Coriant America Inc., et al., No. 2:16-CV-1302, Dkt. No. 615 (E.D. Tex. Dec. 5, 2017) (Gilstrap, J.) (Memorandum Opinion and Order denying summary judgment and clarifying construction of "phase modulation" in the '898 Patent) ("Coriant MSJ Order");

Oyster Optics, LLC v. Infinera Corp., No. 2:18-CV-206, Dkt. No. 62 (E.D. Tex. May 3, 2019) (Gilstrap, J.) (Claim Construction Memorandum and Order construing "output data" in the '898 Patent) ("Infinera I");

Oyster Optics, LLC v. Infinera Corp., et al., No. 2:19-CV-257, Dkt. No. 88 (E.D. Tex. July 23, 2020) (Payne, J.) (Claim Construction Memorandum Opinion and Order construing "phase modulate" in the '500 Patent) ("Infinera II"); and

Oyster Optics, LLC v. Ciena Corp., No. 4:17-CV-05920, Dkt. No. 127 (N.D. Cal. Aug. 10, 2020) (White, J.) ("Ciena").

Shortly before the start of the April 23, 2021 hearing, the Court provided the parties with preliminary constructions with the aim of focusing the parties' arguments and facilitating discussion. Those preliminary constructions are noted below within the discussion for each term.

II. LEGAL PRINCIPLES

“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’” *Phillips*, 415 F.3d at 1312 (quoting *Innova/Pure Water Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). Claim construction is clearly an issue of law for the court to decide. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970–71 (Fed. Cir. 1995) (en banc), *aff’d*, 517 U.S. 370 (1996). “In some cases, however, the district court will need to look beyond the patent’s intrinsic evidence and to consult extrinsic evidence in order to understand, for example, the background science or the meaning of a term in the relevant art during the relevant time period.” *Teva*, 135 S. Ct. at 841 (citation omitted). “In cases where those subsidiary facts are in dispute, courts will need to make subsidiary factual findings about that extrinsic evidence. These are the ‘evidentiary underpinnings’ of claim construction that we discussed in *Markman*, and this subsidiary factfinding must be reviewed for clear error on appeal.” *Id.* (citing 517 U.S. 370).

To determine the meaning of the claims, courts start by considering the intrinsic evidence. See *Phillips*, 415 F.3d at 1313; see also *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 861 (Fed. Cir. 2004); *Bell Atl. Network Servs., Inc. v. Covad Commc’ns Group, Inc.*, 262 F.3d 1258, 1267 (Fed. Cir. 2001). The intrinsic evidence includes the claims themselves, the specification, and the prosecution history. See *id.* at 1314; *C.R. Bard*, 388 F.3d at 861. Courts give claim terms their ordinary and accustomed meaning as understood by one of ordinary skill in the art at the time

of the invention in the context of the entire patent. *Id.* at 1312–13; *accord Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1368 (Fed. Cir. 2003).

The claims themselves provide substantial guidance in determining the meaning of particular claim terms. *Id.* First, a term's context in the asserted claim can be very instructive. *Id.* Other asserted or unasserted claims can aid in determining the claim's meaning because claim terms are typically used consistently throughout the patent. *Id.* Differences among the claim terms can also assist in understanding a term's meaning. *Id.* For example, when a dependent claim adds a limitation to an independent claim, it is presumed that the independent claim does not include the limitation. *Id.* at 1314–15.

“[C]laims ‘must be read in view of the specification, of which they are a part.’” *Id.* at 1315 (quoting *Markman*, 52 F.3d at 979). “[T]he specification ‘is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.’” *Id.* (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)); *accord Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002). This is true because a patentee may define his own terms, give a claim term a different meaning than the term would otherwise possess, or disclaim or disavow the claim scope. *Id.* at 1316. In these situations, the inventor's lexicography governs. *Id.* The specification may also resolve the meaning of ambiguous claim terms “where the ordinary and accustomed meaning of the words used in the claims lack sufficient clarity to permit the scope of the claim to be ascertained from the words alone.” *Teleflex*, 299 F.3d at 1325. But, “[a]lthough the specification may aid the court in interpreting the meaning of disputed claim language, particular embodiments and examples appearing in the specification will not generally be read into the claims.” *Comark Commc'ns, Inc.*

v. Harris Corp., 156 F.3d 1182, 1187 (Fed. Cir. 1998) (quoting *Constant v. Advanced Micro-Devices, Inc.*, 848 F.2d 1560, 1571 (Fed. Cir. 1988)); *accord Phillips*, 415 F.3d at 1323.

The prosecution history is another tool to supply the proper context for claim construction because a patent applicant may also define a term in prosecuting the patent. *Home Diagnostics, Inc. v. Lifescan, Inc.*, 381 F.3d 1352, 1356 (Fed. Cir. 2004) (“As in the case of the specification, a patent applicant may define a term in prosecuting a patent.”). “[T]he prosecution history (or file wrapper) limits the interpretation of claims so as to exclude any interpretation that may have been disclaimed or disavowed during prosecution in order to obtain claim allowance.” *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 (Fed. Cir. 1985).

Although extrinsic evidence can be useful, it is “less significant than the intrinsic record in determining the legally operative meaning of claim language.” *Phillips*, 415 F.3d at 1317 (citations and internal quotation marks omitted). Technical dictionaries and treatises may help a court understand the underlying technology and the manner in which one skilled in the art might use claim terms, but technical dictionaries and treatises may provide definitions that are too broad or may not be indicative of how the term is used in the patent. *Id.* at 1318. Similarly, expert testimony may aid a court in understanding the underlying technology and determining the particular meaning of a term in the pertinent field, but an expert’s conclusory, unsupported assertions as to a term’s definition are entirely unhelpful to a court. *Id.* Generally, extrinsic evidence is “less reliable than the patent and its prosecution history in determining how to read claim terms.” *Id.*

“[P]rior orders in related cases do not bar the Court from conducting additional construction in order to refine earlier claim constructions.” *TQP Dev., LLC v. Intuit Inc.*, No. 2:12-CV-180-WCB, 2014 WL 2810016, at *6 (E.D. Tex. June 20, 2014) (Bryson, J., sitting by designation).

In general, however, prior claim construction proceedings involving the same patents-in-suit are “entitled to reasoned deference under the broad principals of *stare decisis* and the goals articulated by the Supreme Court in *Markman*, even though *stare decisis* may not be applicable *per se.*” *Maurice Mitchell Innovations, LP v. Intel Corp.*, No. 2:04-CV-450, 2006 WL 1751779, at *4 (E.D. Tex. June 21, 2006) (Davis, J.); *see TQP*, 2014 WL 2810016, at *6 (Bryson, J., sitting by designation) (“[P]revious claim constructions in cases involving the same patent are entitled to substantial weight, and the Court has determined that it will not depart from those constructions absent a strong reason for doing so.”); *see also Teva*, 135 S. Ct. at 839–40 (“prior cases will sometimes be binding because of issue preclusion and sometimes will serve as persuasive authority”) (citation omitted); *Finisar Corp. v. DirecTV Grp., Inc.*, 523 F.3d 1323, 1329 (Fed. Cir. 2008) (noting “the importance of uniformity in the treatment of a given patent”) (quoting *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 390 (1996)).

III. AGREED TERMS

The parties reached agreement on certain constructions as stated in their January 29, 2021 Joint Claim Construction and Prehearing Statement (Dkt. No. 56 at 1), their briefing (*see* Dkt. No. 61 at 18 n.5), and their April 9, 2021 Joint Claim Construction Chart (Dkt. No. 67-1). Those agreements are set forth in Appendix A to the present Claim Construction Memorandum and Order. Additional agreements reached at the April 23, 2021 claim construction hearing are set forth herein.

IV. DISPUTED TERMS IN U.S. PATENT NO. 6,665,500

A. “phase-modulated” Terms, “amplitude-modulated” Terms, and “mode”

“phase modulate” and variants, including “phase modulating” (’500 Patent, Claims 1, 17)	
Plaintiff’s Proposed Construction	Defendant’s Proposed Construction
“phase modulate” and variants, including “phase modulating”: “alter the phase of light to create an optical signal having a phase that is representative of data”	“phase modulating” means: “altering the phase of light to create an optical signal having a phase that is representative of data, where the phase modulating does not include amplitude modulating”
“phase-modulated optical signals” (’500 Patent, Claim 1)	
“phase modulated optical data” (’500 Patent, Claim 16)	
Plaintiff’s Proposed Construction	Defendant’s Proposed Construction
“phase modulate” should be construed as set forth above. Otherwise, no construction necessary.	“optical signals created by phase modulation, not amplitude modulation”
“amplitude-modulating” (’500 Patent, Claims 1, 17)	
Plaintiff’s Proposed Construction	Defendant’s Proposed Construction
“amplitude modulate” and variants means “altering the amplitude of light to create an optical signal that is representative of data.” Otherwise no construction necessary.	“altering the amplitude of light to create an optical signal having an amplitude that is representative of data, where the amplitude modulating does not include phase modulating”

“amplitude-modulated signals” (’500 Patent, Claim 16)	
“amplitude-modulated optical data” (’500 Patent, Claim 17)	
Plaintiff’s Proposed Construction	Defendant’s Proposed Construction
“amplitude modulate” should be construed as set forth above. Otherwise, no construction necessary.	“optical signals created by amplitude modulation, not phase modulation”
“mode” (’500 Patent, Claims 1, 16, 17)	
Plaintiff’s Proposed Construction	Defendant’s Proposed Construction
No construction necessary.	“period during which at least one specific optical data signal is either amplitude modulated or phase modulated, but not both”

Dkt. No. 56 at 2; Dkt. No. 61 at 8; Dkt. No. 62 at 3; Dkt. No. 63 at 1; Dkt. No. 67-1 at 1–5.

Shortly before the start of the April 23, 2021 hearing, the Court provided the parties with the following preliminary constructions:

<u>Term</u>	<u>Preliminary Construction</u>
“phase modulate” and variants including: “phase modulating”	“alter the phase of light to create an optical signal having a phase that is representative of data”
“phase-modulated optical signals” “phase modulated optical data”	Plain and ordinary meaning apart from the Court’s construction of “phase modulate”
“amplitude-modulating”	“altering the amplitude of light to create an optical signal having an amplitude that is representative of data”

“amplitude-modulated signals”	Plain and ordinary meaning apart from the Court’s construction of “amplitude modulating”
“amplitude-modulated optical data”	
“mode”	“manner of operation during which at least one specific optical data signal is either amplitude modulated or phase modulated, but not both simultaneously”

At the April 23, 2021 hearing, both sides agreed to these preliminary constructions except as to the term “mode.” As to the term “mode,” Defendant agreed with the Court’s preliminary construction, and Plaintiff opposed.

(1) The Parties’ Positions

Plaintiff argues that “in the context of the ’500 patent, phase modulation and amplitude modulation are not mutually exclusive,” which Plaintiff submits is the conclusion that the Court reached in *Infinera II*. Dkt. No. 61 at 9; *see id.* at 8–11. Plaintiff argues that this conclusion is supported by the Summary of the Present Invention section of the specification and also is apparent in the claims. *Id.* at 8–9. Further, Plaintiff cites the doctrine of claim differentiation. *Id.* at 10.

Defendant responds: “The prosecution history instructs that the distinguishing feature of the purported invention was that it had two modes, separated in time from one another, in which an optical signal was either amplitude modulated or phase modulated, but not both.” Dkt. No. 62 at 4. Defendant also submits: “Oyster mistakenly briefed Infinera’s proposed construction from the prior case — not Cisco’s construction. Whereas Infinera sought to apply Judge Gilstrap’s construction (based on the Group 2 Patents [such as the ’898 Patent]) to the ’500 Patent, Cisco does not.” *Id.* at 5–6. Defendant further urges:

The dispute here does not center on whether any use of phase modulation during a “mode” excludes any use of amplitude modulation (or vice-versa) during that mode. Instead, the point of Cisco’s construction is that for any given optical signal (i.e., for any given signal created by the act of altering light (i.e. modulating) to represent a given data stream), the claim refers only to *phase* modulation for *that*

given signal (regardless of whether the transmitter can also be creating a different signal corresponding to a different data stream using amplitude modulation during that same mode). This is compelled by the specification and the prosecution history, and is the only way to give each claim element meaning.

Id. at 6. Defendant submits that “Cisco’s proposed constructions permit both amplitude modulation and phase modulation of light to occur within a given ‘mode’ – but it would correspond to *two different data streams*, exactly as set forth in the intrinsic record.” *Id.* at 6–7. Defendant further explains:

[U]nlike Infinera, Cisco does not argue that the claims have an exclusive “phase modulation mode.” Instead, Cisco’s point is that a given signal corresponding to a given data stream must be either amplitude modulated or phase modulated, but those two signals (corresponding to two different data streams) can be combined into a signal (like signal 25 in the specification) that transmits the two different data streams (one via phase modulation and the other via amplitude modulation – combined together). What is never disclosed anywhere in the patents – and was disclaimed in the prosecution history – is the notion of modulating a single data stream using both amplitude and phase modulation (i.e., representing a bit or group of bits by using both the phase and amplitude of the signal).

Id. at 11. Defendant submits that “the specification never teaches, shows or describes a modulator that simultaneously performs the act of modulating the phase of light while also performing the act of modulating the amplitude of the light for the same signal (i.e., the same data signal), at the same time.” *Id.* at 13. Finally, Defendant argues that “Oyster’s proposal has the unsatisfactory consequence of making the first and second modes of the claims be, for all intents and purposes, the same.” *Id.* at 15.

Plaintiff replies that “Cisco’s brief explains at length a purported distinction from Infinera’s construction that is not apparent from the constructions it proposes for the jury.” Dkt. No. 63 at 2. Plaintiff emphasizes that the Court in *Infinera II* found that “[t]he patent differentiates the ‘mixed’ signal from a simple switching between signal types.” *Id.* (quoting *Infinera II* at 10). Plaintiff also argues that “the patent considers Signal 25 in Figure 2 to be an example of switching between two

modes, not as a single mode with both amplitude modulation and phase modulation.” Dkt. No. 63 at 3. Further, Plaintiff argues that “Cisco’s notion that the patent requires a ‘data stream’ that is used solely with phase modulation or solely with amplitude modulation is unsupported by the actual teachings of the patent and contradicted by the language of claim 1, and it should be rejected by this Court.” *Id.* Plaintiff submits that “claim 1 refers to only a single ‘data stream’ and expressly requires using that single data stream (or portions of the stream at least) both for phase modulation and for amplitude modulation at different points in time.” *Id.* Plaintiff urges that “a mode is a particular way that the device operates to transmit or receive data,” not a “period.” *Id.* at 3–4.

At the April 23, 2021 hearing, Plaintiff urged that the specification allows for using amplitude modulation and phase modulation simultaneously even as to the same data signal. As to the prosecution history, Plaintiff argued that any consideration of a purported disclaimer should consider how the amendments changed the claims and what feature of the prior art was distinguished by the amendments. Plaintiff also emphasized dependent Claims 18 and 19 as demonstrating that independent Claim 17 is broader than what Defendant proposes.

(2) Analysis

As background, the ’500 Patent discloses that amplitude-modulated optical signals are simple to generate but are easily “tapped” (such as by someone attempting to obtain and decode the signals for malicious purposes).

In current fiber optic networks, an electronic data stream is fed to a laser amplitude modulator. The laser amplitude modulator typically pulses or alters the laser output to create an amplitude-modulated optical signal representative of the electronic data stream. The laser amplitude modulator and laser thus define a transmitter for transmitting the optical signal over an optical fiber, which is then received by a receiver. The receiver for the amplitude-modulated optical signals of the optical data typically includes a photodiode to convert the optical signals back into the electronic data stream.

The reading of the amplitude-modulated optical data signals using a photodiode is straightforward: the optical signals either produce an electric output at the photodiode or they do not. As a result, an output electronic data stream of zeros and ones is generated.

However, optical fiber may be tapped. The optical fibers can be spliced or even merely clamped so as to obtain optical signals from the fiber. It also may be possible to tap fibers without physically touching the optical fiber, for example by reading energy emanating or dissipating along the fiber. Amplitude-modulated optical signals, with their ease of detection from a photodiode, require that only a small amount of energy be tapped and passed through the photodiode in order to be converted into a tapped electronic data stream.

'500 Patent at 1:12–38.

Phase-modulated signals, by contrast, are more secure because such signals are more difficult for a tap to read (and are more difficult to tap without the tap being detected):

During the alternate phase-modulation mode, the amplitude controller 88 directs the laser to emit constant wavelength, non-pulsed light. Depending on the output OP of circuit 82, phase modulator 16 then either imparts a known initial phase shift to the light which could be 0 degrees or else imparts another known offset phase shift preferably equal to the known initial phase shift+180 degrees on the light passing through phase modulator 16. An optical signal 22, which represents a stream of binary bits, is thus created. Optical signal 22 is transmitted over fiber 20. This signal provides a secure data transmission mode. The phase-modulated signal must be read with an interferometer having a proper delay path, and any tap to obtain enough light to read the phase-modulated signal is easily detectable.

Id. at 5:35–48; *see id.* at 2:50–52 (“highly secure”).

A transmitter having amplitude-modulating capability may be “backwards-compatible with existing receivers in the amplitude-modulated mode.” *Id.* at 6:10–11. Further:

Controlling of the change between secure mode and the amplitude-modulated modes can function in a variety of ways, depending on the overall system configuration. With the transmitter 10 and the receiver 30, an operator can configure the transmitter 10 and receiver 30 so that the system functions in any of the three modes.

Id. at 7:51–57; *see id.* at 8:13–17 (“telecommunications service provider thus could charge certain customers for an enhanced secure mode service . . . while permitting other customers to send data in a non-secure mode . . .”).

As a threshold matter, the parties dispute the meaning of “mode.” Defendant interprets the term “mode” as meaning “period during which at least one specific optical data signal is either amplitude modulated or phase modulated, but not both.” Dkt. No. 62 at 3. Defendant’s interpretation of “mode” as a “period” of time, however, is inconsistent with Claims 4 and 5 of the ’500 Patent, which recite:

4. The transmitter as recited in claim 1 wherein the controller has a switch for switching between the first and second modes.
5. The transmitter as recited in claim 4 wherein the switch is operator-activated.

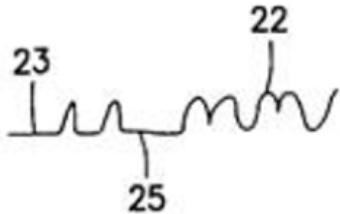
This recital of a “switch” for “switching between” modes in dependent Claim 4 weighs in favor of Plaintiff’s interpretation of “mode” as a manner of operation, not a period of time. Dependent Claim 5 reinforces this understanding by reciting that the “switch” is “operator-activated.” Disclosures in the specification are consistent with this understanding, such as the following:

The controller preferably has two circuits, a first circuit for controlling the phase modulation and a second circuit controlling the amplitude modulation. Preferably, a switch, which may be composed of hardware or software, is provided to activate the first mode, the delayed second mode, or the direct second mode. An operator may set the switch of a first transmitter to the first mode, the delayed second mode, or the direct second mode, so that the transmitter generally always operates in that mode.

Alternately, the switch can be controlled by bit data in a packet of a packet-based data input stream.

’500 Patent at 3:12–22.

Defendant points to a statement in the Summary of the Present Invention that “[t]he present invention thus permits a phase-modulated transmission mode or an amplitude-modulated transmission mode, or *both a phase and amplitude modulated transmission mode*, which can permit the transmitter to work with different types of receivers.” *Id.* at 2:41–44 (emphasis added). Defendant argues that “[a] mode during which a combined signal like signal 25 is transmitted reflects an example of a mode that uses both phase and amplitude modulation,” and “[s]ignals 22 and 23 are separate phase- and amplitude-modulated signals transmitted in sequence to form combined signal 25 [shown in Figure 2 of the ’500 Patent], which is an example of the patent’s mixed-mode modulation.” Dkt. No. 62 at 5 n.4. The portion of Figure 2 cited and reproduced by Defendant in its responsive brief (*id.* at 4) is reproduced here:



The specification discloses: “Signal 25 in FIG. 2 is shown as a combination of amplitude-modulated signals 23 and phase-modulated signals 22, which occurs for example when packets with different modes are sent one after another.” ’500 Patent at 7:62–65.

A fair reading of this disclosure is that signal 25 in Figure 2 is not a single “mode” with both amplitude modulation and phase modulation but rather is an example of switching between different manners of operation. *See id.*

In sum, the term “mode” refers to a manner of operation rather than a period of time. This interpretation, based on the foregoing, is further reinforced by disclosures regarding “[c]ontrolling of the change between secure mode and the amplitude-modulated modes” and that a “telecommunications service provider thus could charge certain customers for an enhanced secure

mode service . . . while permitting other customers to send data in a non-secure mode” *Id.* at 7:51–57, 8:13–17.

Turning to the remaining disputes, the Court addressed similar competing proposals in *Infinera II*. There, the Court rejected a proposal that “[u]se of phase modulation excludes use of amplitude modulation” and noted that “the specification expressly contemplates ‘a mixture of phase and amplitude modulation’” *Infinera II* at 9 (quoting ’500 Patent at 4:37–41). *Infinera II* also considered dependent Claim 18 of the ’500 Patent and found that “the doctrine of claim differentiation bolsters Oyster’s position” *Infinera II* at 11. Further, *Infinera II* rejected arguments based on the prosecution history, such as amendments to Claim 17 of the ’500 Patent so as to recite “the second alternate transmission mode occurring at a time separate from the first transmission mode.” *Id.* at 12.

The dispute in the present case is slightly different than the dispute in *Infinera II*. In *Infinera II*, as discussed above, the parties disputed whether use of phase modulation excludes use of amplitude modulation. In the present case, the parties dispute whether “a given signal corresponding to a given data stream must be either amplitude modulated or phase modulated,” such that “a single data stream [cannot] us[e] both amplitude and phase modulation.” Dkt. No. 62 at 11; *see id.* (Defendant argues that the patent does not provide for “representing a bit or group of bits by using both the phase and amplitude of the signal”).

The disputed terms appear in Claims 1, 16, and 17 of the ’500 Patent, which recite (emphasis added):

1. An optical data transmitter comprising:
 - a laser;
 - a phase modulator for *phase modulating* light from the light source; and
 - a controller having an input for receiving an electronic data stream, the controller in a first mode controlling the phase modulator so as to create *phase-modulated optical signals* in the light from the laser as a function of the electronic

data stream and the controller in a second alternate mode *amplitude-modulating* the light from the laser as a function of the electronic data stream, the first mode and the second mode occurring at different times.

* * *

16. A dual-mode optical transmission system comprising:

a transmitter having a laser for transmitting *amplitude-modulated signals* in a first mode and *phase-modulated signals* in a second mode and a controller for switching an output of the laser between the first mode and the second mode, the second mode occurring at a different time than the first mode;

an optical fiber connected to the transmitter; and

a receiver having an interferometer being connected to the optical fiber.

17. A method for transmitting optical data in two modes comprising the steps of:

phase modulating light from a laser during a first transmission mode so as to transmit *phase-modulated optical data*; and

amplitude modulating light from the laser during a second alternate transmission mode so as to transmit *amplitude-modulated optical data*, the second alternate transmission mode occurring at a time separate from the first transmission mode.

Plaintiff cites the doctrine of claim differentiation as to dependent Claim 18. *See, e.g.*,

Tandon Corp. v. U.S. Int'l Trade Comm'n, 831 F.2d 1017, 1023 (Fed. Cir. 1987) (“the doctrine of claim differentiation states the presumption that the difference between claims is significant”) (citations omitted); *SunRace Roots Enter. Co., Ltd. v. SRAM Corp.*, 336 F.3d 1298, 1303 (Fed. Cir. 2003) (claim differentiation “is especially strong when the limitation in dispute is the only meaningful difference between an independent and dependent claim, and one party is urging that the limitation in the dependent claim should be read into the independent claim”) (citation omitted).

Claims 18 and 19 depend from Claim 17, and Claims 17–19 recite (emphasis added):

17. A method for transmitting optical data in two modes comprising the steps of:

phase modulating light from a laser during a first transmission mode so as to transmit *phase-modulated optical data*; and

amplitude modulating light from the laser during a second alternate transmission mode so as to transmit *amplitude-modulated optical data*, the second

alternate transmission mode occurring at a time separate from the first transmission mode.

18. The method as recited in claim 17 wherein during the first transmission mode *the light is not amplitude-modulated.*

19. The method as recited in claim 17 wherein during the second alternate transmission mode *the light is both amplitude-modulated and phase-modulated.*

Infinera II found that the doctrine of claim differentiation (as applied to dependent Claim 18) weighed against the defendant's proposal in that case that "use of phase modulation excludes use of amplitude modulation." See *Infinera II* at 7, 11.

In the present case, however, Defendant's proposed interpretation does not necessarily give rise to any inconsistency or any conflict with the doctrine of claim differentiation as to Claims 18 and 19 because Defendant proposes limiting the modulation of the *data stream*, not the modulation of the "light from the laser" recited in above-reproduced Claims 17, 18, and 19. Thus, as Defendant puts it, whereas "under Infinera's rejected construction, the 'use' of phase modulation for one data stream would exclude the use of amplitude modulation for a different data stream," under Defendant's proposal "phase-modulated signals can co-exist with amplitude-modulated signals . . . for separate signals." Dkt. No. 62 at 7.

As to Claim 19, the recital that "the *light* is both amplitude-modulated and phase-modulated" does not compel finding that a particular "data stream" could be both amplitude-modulated and phase-modulated. Instead, Claim 19 recites that *the light* is phase-modulated in the first mode and *the light* is both phase-modulated and amplitude-modulated in the second mode.

Defendant also notes that "[a]lthough claim differentiation is a useful analytic tool, it cannot enlarge the meaning of a claim beyond that which is supported by the patent documents, or relieve any claim of limitations imposed by the prosecution history." *Fenner Invs., Ltd. v. Cellco P'ship*, 778 F.3d 1320, 1323 (Fed. Cir. 2015).

Turning to the other intrinsic evidence, Defendant notes that the Summary gives an example of a “mixture” in which amplitude-modulated signals are for a separate data stream:

It should be understood however that, while phase modulated signals are preferred in the secure transmission mode, under certain circumstances a mixture of phase and amplitude modulation could be possible. *For example*, amplitude modulated signals *not related to the input optical data stream* could be transmitted during the secure phase modulation mode without necessarily affecting security.

’500 Patent at 4:35–41 (emphasis added).

This distinction between optical signals and underlying data streams is consistent with the Abstract of the ’500 Patent, which refers to (emphasis added): “a controller having an input for receiving an electronic *data stream*, the controller in a first mode controlling the phase modulator so as to create phase-modulated *optical signals* in the light as a function of the electronic *data stream* and the controller in a second alternate mode amplitude-modulating the light as a function of the electronic *data stream*. ”

Also, the Summary section discloses that two separate lasers may be used, one for amplitude modulated signals and one for phase modulated signals, and the light from the two lasers may be combined:

The at least one light source may include two lasers, a first laser for the amplitude-modulated signals, and a second laser for the phase-modulated signals. A coupler couples the light from the two lasers together. Preferably, however, a single laser directly next to the phase-modulator is provided. This prevents delay between the laser and the phase-modulator when modes are switched.

Id. at 3:40–46.

This is further consistent with Figure 1 of the ’500 Patent illustrating two distinct encoders, one for phase modulation and one for amplitude modulation, and the Summary of the Present Invention discloses objectives of providing *either* phase modulation *or* amplitude modulation:

An object of the present invention is to provide a transmitter for transmitting either phase-modulated or amplitude modulated optical signals. An alternate or additional

object of the present invention is to provide a receiver for receiving either phase-modulated or amplitude-modulated optical signals.

'500 Patent at 2:26–31; *see id.* at 4:4–12 (“dual-mode optical transmission system”; “transmitting amplitude-modulated signals in a first mode and phase modulated signals in a second mode”; “can be switched based on either an operator input or packet-based data”).

Yet, these statements regarding using “either” phase modulation “or” amplitude modulation are not necessarily limiting because “[t]he objective described is merely one of several objectives that can be achieved through the use of the invention.” *Brookhill-Wilk I, LLC v. Intuitive Surgical, Inc.*, 334 F.3d 1294, 1301 (Fed. Cir. 2003). Further, the Summary of the Present Invention section of the specification also refers to a transmission mode that is “both a phase and amplitude modulated transmission mode”:

The present invention provides a transmitter having at least one light source, a phase modulator for phase modulating light from the light source, and a controller having an input for receiving an electronic data stream, the controller in a first mode controlling the phase modulator so as to create phase-modulated optical signals in the light as a function of the electronic data stream and the controller in a second alternate mode amplitude-modulating the light as a function of the electronic data stream.

The present invention thus permits a phase-modulated transmission mode or an amplitude-modulated transmission mode, or *both a phase and amplitude modulated transmission mode*, which can permit the transmitter to work with different types of receivers. An optical fiber typically connects the transmitter of the present invention to the receiver.

The controller in the first mode preferably phase-modulates the light as a function of an output of a delayed-feedback exclusive-or gate having the electronic data stream as an input. The first mode is thus a highly secure data transmission mode, as described in co-owned and co-pending U.S. patent application Ser. No. 09/765,153, entitled “Secure Fiber Optics Telecommunications System and Method” and filed on Jan. 17, 2001, [which issued as United States Patent No. 6,594,055,] the entire disclosure of which is hereby incorporated by reference herein.

In the second mode, the light may be amplitude modulated either by altering the energy provided to the light source or by altering the light emitted by the light

source. The light source preferably is a laser, for example a semiconductor laser operating at a 1550 nm, or other, wavelength.

In the second mode, the light may be amplitude modulated either in direct relation to an input data stream (known as the direct second or amplitude-modulated mode), or as a function of an output of a delayed-feedback exclusive-or gate having the electronic data stream as an input (known as the delayed second or amplitude-modulated mode). *In the delayed second mode, the optical signal may or may not also be phase modulated.* In the direct second mode, the amplitude-modulated optical signals sent by the transmitter can be read [by] common receivers, or by the receiver of the present invention. In the delayed second mode, the amplitude-modulated optical signals can be read by the receiver of the present invention as well as by the receiver of incorporated-by-reference U.S. patent application Ser. No. 09/765,153, entitled “Secure Fiber Optics Telecommunications System and Method” and filed on Jan. 17, 2001, [which issued as United States Patent No. 6,594,055].

The controller preferably has two circuits, a first circuit for controlling the phase modulation and a second circuit controlling the amplitude modulation. Preferably, a switch, which may be composed of hardware or software, is provided to activate the first mode, the delayed second mode, or the direct second mode. An operator may set the switch of a first transmitter to the first mode, the delayed second mode, or the direct second mode, so that the transmitter generally always operates in that mode.

Alternately, the switch can be controlled by bit data in a packet of a packet-based data input stream. The bit data may be set for example to zero or one or two or three, so that the data contained in the packet is sent either via the first mode or via the direct second mode or the delayed second mode with no phase modulation or the delayed second mode with phase modulation as a function of the bit data. The transmitter thus produces an alternating amplitude-modulated and phase-modulated data stream, which can be read by a receiver of the present invention. The packets preferably contain data regarding the transmission mode for the next packet so as to permit the receiver to have time to switch between alternate receive modes.

’500 Patent at 2:32–3:33 (emphasis added).

Infinera II noted disclosure of what the defendants in that case referred to as a “specialized receiver” (*Infinera II* at 9–10), which “can read a *mixed* optical signal of both phase-modulated and direct and delayed amplitude-modulated signals”:

[T]he specification . . . disclos[es] a “specialized receiver,” which “can read a *mixed* optical signal of both phase-modulated and direct and delayed amplitude-modulated signals” ’500 Patent at 3:62–64 (emphasis added).[fn] The patent

differentiates the “mixed” signal from a simple switching between signal types. *See id.* at 4:36–43 (referring to simultaneous amplitude- and phase-modulation as “a mixture of phase and amplitude modulation”).

[fn: This does not mean the receiver would necessarily use both the phase- and amplitude-modulated components of such a mixed signal. Referring to Figure 2, for example, the user would select which of the signals to use with switch 39. *See id.* at 7:31–44 (describing use of switch 39 to connect either the photodiode 35 or the filter 50 to the output 37).]

Infinera II at 10.

Nonetheless, the prosecution history can be an important component of the intrinsic evidence and may contain disclaimers. *See, e.g., Omega Eng’g, Inc. v. Raytek Corp.*, 334 F.3d 1314, 1325–26 (Fed. Cir. 2003) (“for prosecution disclaimer to attach, our precedent requires that the alleged disavowing actions or statements made during prosecution be both clear and unmistakable”).

In response to an Office Action (*see* Dkt. No. 62-6 at 103–116), the patentee amended the claims including as follows (deletions in strikeout and additions underlined, as in original):

Claim 1 (currently amended) An optical data transmitter comprising:

~~at least one light source~~ a laser;

a phase modulator for phase modulating light from the light source; and

a controller having an input for receiving an electronic data stream, the controller in a first mode controlling the phase modulator so as to create phase-modulated optical signals in the light from the laser as a function of the electronic data stream and the controller in a second alternate mode amplitude-modulating the light from the laser as a function of the electronic data stream, the first mode and the second mode occurring at different times.

* * *

Claim [16] (currently amended): A dual-mode optical transmission system comprising:

a transmitter having a laser for transmitting amplitude-modulated signals in a first mode and phase-modulated signals in a second mode and a controller for switching an output of the laser between the first mode and the second mode, the second mode occurring at a different time than the first mode;

an optical fiber connected to the transmitter; and

a receiver having an interferometer being connected to the optical fiber.

Claim [17] (currently amended): A method for transmitting optical data in two modes comprising the steps of:

phase modulating light from ~~at least one light source~~ a laser during a first transmission mode so as to transmit phase-modulated optical data; and

amplitude modulating light from the ~~at least one light source~~ laser during a second alternate transmission mode so as to transmit amplitude-modulated optical data, the second alternate transmission mode occurring at a time separate from the first transmission mode.

Id. at 119–121; *see id.* at 118–27.

The patentee argued, as to the “Djupsjöbacka” reference (Dkt. No. 62-7):

Claim 1 has been amended to recite the laser limitation of claim 9 Claim 1 also has been amended to clarify that the second mode occurs at a different point in time than the first mode.

* * *

Djupsjobacka discloses simultaneous transmission of optical signals in AM or PM mode, the *same signal* being sent in AM and PM mode *at the same time*. (See for example Djupsjobacka at column 2, lines 50 to 54).

* * *

. . . Djupsjobacka . . . transmits AM and PM signals at exactly the same time, and not in two different time modes, as now claimed.

* * *

Claim 18 now recites a transmitter having a laser for transmitting amplitude-modulated signals in a first mode and phase-modulated signals in a second mode and a controller for switching an output of the laser between the first mode and the second mode, the second mode occurring at a different time than the first mode.

Neither Djupsjobacka [nor the other cited references] shows such different time modes for modulating one laser. *Djupsjobacka shows simultaneous AM/PM transmission.*

Id. at 123–25 (emphasis added) (citing Dkt. No. 62-7 at 2:50–54). The examiner subsequently allowed the claims, and the ’500 Patent issued. *See id.* at 132–33.

The patentee thus stated that what is “now claimed” is using amplitude modulation and phase modulation “in two different time modes.” *Id.* at 124.

As to Defendant’s proposal that “mode” refers to a period of time, perhaps this use of “time modes” during prosecution could be read as being consistent with Defendant’s above-discussed interpretation. More reasonable, however, is that the phrase “in two different time modes” refers to different manners of operation being used at different times. *See, e.g.*, ’550 Patent at Cl. 1 (“the first mode and the second mode occurring at different times”). Indeed, this prosecution history refers to using “AM and PM mode at the *same time*,” which is consistent with Plaintiff’s interpretation of “mode” as a manner of operation, not a period of time. Dkt. No. 62-6 at 123.

Plaintiff argues that “[a]s neither the examiner nor Oyster ever argued that Djupsjöbacka had a mode with simultaneous amplitude and phase modulation in the same mode, nothing that Oyster did to distinguish Djupsjöbacka would exclude such a mode from the scope of the claims.” Dkt. No. 63 at 5. This argument is unpersuasive at least because Djupsjöbacka discussed “modes” in the context of “orthogonal polarization modes,” wherein different types of modulation could be employed simultaneously. *See, e.g.*, Dkt. No. 62-7 at *Abstract*, 1:28–30. This is different from how the ’500 Patent uses the term “mode” to refer to a manner of operation, as discussed above.

In *Infinera II*, the Court found that this prosecution history regarding Djupsjöbacka did not give rise to any disclaimer that would have supported the defendants’ proposed construction in that case, explaining as follows:

[T]he applicant’s amendments and remarks do not help Defendants. The added language concerns whether the two modes are mutually exclusive in time. In contrast, the present dispute concerns whether the two modes are mutually exclusive in their operating characteristics. Notably, there is no sound reason for why the added language would only affect the phase-modulation mode. Put another way, if the applicant’s amendment had the effect proffered by Defendants, it would not only exclude any *amplitude* modulation during the *phase*-modulation mode, but any *phase* modulation during the *amplitude*-modulation mode. Yet Defendants

agree the latter is not required by the claims. *See* [No. 2:19-CV-257,] Dkt. No. 73 at 21 (“Defendants do not claim that ‘amplitude modulation’ must be construed to exclude phase modulation.”). This apparent inconsistency weighs against finding the prosecution history supports Defendants’ construction.

Infinera II at 12.

Here, however, the dispute is not “whether the two modes are mutually exclusive in their operating characteristics” (*id.*) but rather is whether the patentee disclaimed modulating a *single data stream* using both amplitude modulation and phase modulation *at the same time*. Dkt. No. 62 at 11.

The patentee distinguished Djupsjöbacka as disclosing “the same signal being sent in AM and PM mode at the same time” (also referred to as “transmit[ting] AM and PM signals at exactly the same time” or “simultaneous AM/PM transmission”) rather than transmitting AM and PM signals “in two different time modes, as now claimed.” Dkt. No. 62-6 at 123–25.

At the April 23, 2021 hearing, Plaintiff urged that the patentee distinguished Djupsjöbacka as having only *one* manner of operation rather than *two* distinct modes as recited in the claims. Perhaps the patentee *could* have made this argument, but in the above-reproduced prosecution history the patentee focused on the simultaneous use of phase modulation and amplitude modulation for a particular signal in Djupsjöbacka. Even if the patentee could have presented a narrower argument, the patentee is bound by the argument actually made:

[T]he scope of surrender is not limited to what is absolutely necessary to avoid a prior art reference; patentees may surrender more than necessary. When this happens, we hold patentees to the actual arguments made, not the arguments that could have been made. The question is what a person of ordinary skill would understand the patentee to have disclaimed during prosecution, not what a person of ordinary skill would think the patentee needed to disclaim during prosecution.

Tech. Props. Ltd. LLC v. Huawei Techs. Co., 849 F.3d 1349, 1359 (Fed. Cir. 2017) (citations omitted); *see Typhoon Touch Techs., Inc. v. Dell, Inc.*, 659 F.3d 1376, 1381 (Fed. Cir. 2011) (“The

patentee is bound by representations made and actions that were taken in order to obtain the patent.”).

By making the above-discussed statements, the patentee provided notice to the public that the claimed “first transmission mode,” for example, does not allow for both phase modulation and amplitude modulation to be performed simultaneously as to a particular data stream at a particular time. *See* Dkt. No. 62-6 at 123–25; *see also Omega Eng’g*, 334 F.3d at 1323 (“As a basic principle of claim interpretation, prosecution disclaimer promotes the public notice function of the intrinsic evidence and protects the public’s reliance on definitive statements made during prosecution.”).¹

Finally, this finding of a specific disclaimer is not inconsistent with the rejection of a disclaimer argument in *Infinera II*. *See Infinera II* at 12. The parties in *Infinera II* disputed, as the Court summarized it, “whether the claim term ‘phase modulate’ limits the operation of the claimed invention in the phase-modulating mode to exclude the use of *any* amplitude modulation.” *Id.* at 8. In the present case, as discussed above, Cisco proposes that these different forms of modulation cannot be used simultaneously for the *same data signal*, and this is indeed supported by the prosecution disclaimer discussed above.²

¹ Extrinsic evidence cited by Defendant, though not conclusive, is at least consistent with this interpretation. For example, Defendant cites a treatise that defines “amplitude-shift keying” as modulating amplitude while keeping phase constant and that defines “phase-shift keying” as modulating phase while keeping amplitude constant. Dkt. No. 62-8, Govind Agrawal, *Fiber-Optic Communication Systems* 244, 246–47 (2d ed. 1997).

² The Court’s preliminary construction for “mode” was (emphasis added): “manner of operation during which at least one specific *optical* data signal is either amplitude modulated or phase modulated, but not both simultaneously.” The phrase “specific optical data signal” appears in Defendant’s proposed construction. On one hand, the specification refers to an “input optical data stream,” which appears to be consistent with Defendant’s proposal. ’500 Patent at 4:40–41. On the other hand, the specification also refers to “reading of . . . amplitude-modulated optical data signals using a photodiode.” *Id.* at 1:24–25. This use of a photodiode implies that the phrase “optical data signals” in this disclosure refers to a beam of light rather than merely a stream of data. *See id.* The disclosure of “input optical data stream,” by contrast, appears to refer not to a beam of light but rather to a stream of data inputted to a modulator (and then the result of this modulation would be optical signals). *See id.* at 4:40–41. To minimize confusion, and to be clear that the “data signal” need not be a beam of light, the Court removes the word “optical” from the construction.

Based on all of the foregoing, the Court hereby construes these disputed terms as set forth in the following chart:

<u>Term</u>	<u>Construction</u>
“phase modulate” and variants, including “phase modulating”	“alter the phase of light to create an optical signal having a phase that is representative of data”
“phase-modulated optical signals” “phase modulated optical data”	Plain meaning apart from the Court’s construction of “phase modulate”
“amplitude-modulating”	“altering the amplitude of light to create an optical signal having an amplitude that is representative of data”
“amplitude-modulated signals” “amplitude-modulated optical data”	Plain meaning apart from the Court’s construction of “amplitude modulating”
“mode”	“manner of operation during which at least one specific data signal is either amplitude modulated or phase modulated, but not both simultaneously”

V. DISPUTED TERMS IN U.S. PATENT NO. 8,913,898

B. “a transmitter having a laser, a modulator, and a controller”

Plaintiff’s Proposed Construction	Defendant’s Proposed Construction
No construction necessary.	“transmitter containing a laser, a modulator, and a controller”

Dkt. No. 56 at 3; Dkt. No. 61 at 11; Dkt. No. 62 at 18; Dkt. No. 63 at 6; Dkt. No. 67-1 ¶¶ 6, 8. The parties submit that this term appears in Claims 1 and 14 of the ’898 Patent. Dkt. No. 56 at 3; Dkt. No. 61 at 11; Dkt. No. 62 at 18; Dkt. No. 63 at 6.

Shortly before the start of the April 23, 2021 hearing, the Court provided the parties with the following preliminary construction: “a transmitter containing a laser, a modulator, and a

controller.” At the hearing, Defendant agreed with the Court’s preliminary construction, and Plaintiff opposed.

(1) The Parties’ Positions

Plaintiff argues that the *Ciena* construction, which is the basis for Defendant’s proposed construction, should be rejected because “[t]here is nothing in the specification indicating that that [the] patentee meant to claim anything other than a transmitter ‘having’ a laser, a modulator, and a controller as that term is used in its ordinary sense.” Dkt. No. 61 at 12. Plaintiff argues that in *Ciena*, the Northern District of California erroneously imported a limitation from a preferred embodiment. *Id.* at 12–13. Plaintiff also argues that there was no disavowal of claim scope during prosecution. *Id.* at 13–14.

Defendant responds that *Ciena* correctly construed this term because “the specification is unequivocal that the laser, modulator and controller must be located on the transmitter” and because “Oyster’s repeated statements during its prosecution of various IPRs clearly show prosecution history disclaimer.” Dkt. No. 62 at 19.

Plaintiff replies: “Oyster does not contest that the transmitter and laser must be part of the same card. However, this does not mean that the laser must be contained within the transmitter as Cisco contends.” Dkt. No. 63 at 6. As to the prosecution history, Plaintiff argues that “Oyster’s actual statements, as opposed to the PTAB’s characterization of the statements, only distinguished the prior art on the grounds that it did not disclose a ‘laser’ at all are [*sic*] as part of a transceiver card—the location of the laser as inside or outside of the transmitter was irrelevant[.]” *Id.* at 7 (citations omitted).

At the April 23, 2021 hearing, Plaintiff argued that the *Ciena* construction might be interpreted too narrowly as requiring the recited components to be on the same board or even on

the same silicon die. Defendant responded that Defendant's proposal is supported by the plain meaning of the disputed term, as demonstrated by the evidence cited in *Ciena* and by the PTAB.

(2) Analysis

Claim 1 of the '898 Patent, for example, recites (emphasis added):

1. A *transceiver card* for a telecommunications box for transmitting data over a first optical fiber and receiving data over a second optical fiber, *the transceiver card comprising:*

a transmitter having a laser, a modulator, and a controller configured to receive input data and control the modulator to generate a first optical signal as a function of the input data;

a fiber output optically connected to the transmitter and configured to optically connect the first optical fiber to the transceiver card;

a receiver configured to receive a second optical signal from the second optical fiber and to convert the second optical signal to output data;

fiber input optically connected to the receiver and configured to optically connect the second optical fiber to the transceiver card; and

an energy level detector optically connected between the receiver and the fiber input to measure an energy level of the second optical signal, wherein the energy level detector includes a plurality of thresholds.

In *Ciena*, the Northern District of California found:

The parties dispute whether the laser, modulator, and controller must be located within the transmitter. *Ciena* argues that the plain meaning of "having" suggests that they are. Moreover, the specification shows the recited elements located on the transmitter, and further states that the transceiver card is designed to be swappable, which would not be possible if components were located outside of the card. (See '898 Patent at Fig. 2, 2:26–29, 6:36–42, 4:32–43.) Further, the specification states that "[t]he laser amplitude modulator and laser . . . define a transmitter for transmitting the optical signal over an optical fiber." (*Id.* at 1:30–32.) The specification thus suggests that the laser and modulator must be located on the transmitter (as the defining elements of that transmitter) and that the controller must be located, at least, on the transceiver card.

Ciena at 21.

Ciena thus found, based on the specification, that a laser and a modulator are defining elements of a transmitter (that is, they are necessary for the "transmitter" to be a "transmitter") and

a laser, a modulator, and a controller must all be on the transceiver card for it to be “swappable.”

See id. The specification discloses:

The present invention thus permits a card-based transmission system incorporating an energy level detector for optical tap detection, which can provide for more secure data transmission than existing amplitude-based cards along with breach localization services from the OTDR. Because of advances in semiconductor and optical component packaging, the OTDR and energy level detector parts along with the optical transmitter and receiver components can fit all on one card compatible with most existing box dimensions.

'898 Patent at 3:9–18; *see* '898 Patent at 4:30–43 (“same package”), 6:36–42 (“the present invention also permits for the removal of existing optical transmission cards to be easily replaced by the enhanced security cards”), 1:22–32 (“a card, which fits into the box”; “In current fiber optic networks, an electronic data stream is fed to an optical fiber multiplexor, which is also called ‘a box’ in the industry.”).

Ciena also relied on prosecution history:

The prosecution history confirms this understanding. During the IPRs for the '898 and '327 Patents, Oyster distinguished prior art that had an external laser by arguing that the claims required the laser to be located on the transmitter. (*See* Dkt. No. 100-12 (“IPR2017-01870 Prelim. Resp.”) at 20–21; Dkt. No. 100-17 (“IPR2017-01871 Prelim. Resp.”) at 23–25.) The examiner agreed with Oyster’s interpretations, citing a dictionary that defined “having” as “to hold, include, or contain as a part or whole.” (IPR2018-00070 Institution Decision at 17.) Oyster [*sic*, *Ciena*] thus argues that disclaimer, in addition to the ordinary meaning, limits “having” to “including within.”

Oyster does not substantively dispute this evidence, but argues that the ordinary meaning of the term should be construed as the examiner found it—“to hold, include, or contain *as a part or whole*.” (*Id.* (emphasis added).) Whatever the merits of dictionary definitions, the one here appears to go beyond the meaning apparent from context provided by the intrinsic evidence. *Cf. Phillips*, 415 F.3d at 1321 (explaining that dictionaries, by their nature, will be broader than the construction required by the patent). Despite citing the dictionary, the examiner ultimately adopted the construction of “having” as “holding, including, or containing.” (IPR2018-00070 Institution Decision at 18.) Moreover, Oyster interpreted “having” in the IPRs as excluding external elements. (IPR2017-01871 Prelim. Resp. at 21.) Finally, the specification “defines” transmitters through the components. ('898 Patent 1:30–32.) Thus, to the extent that some parts of the transmitter may extend

beyond its boundaries, they must still be substantially “contained” by the transmitter to constitute the same component.

Accordingly, the Court construes “transmitter having a laser, a modulator, and a controller” as a “transmitter containing a laser, a modulator, and a controller.”[fn]

[fn: The Court fails to detect a substantive difference between “holding,” “including,” and “containing,”—all of which appear to refer to the transmitter physically encompassing the components—and thus adopts a construction based on “containing.” *See Ecolab, Inc. v. Paraclipse, Inc.*, 285 F.3d 1362, 1374 (Fed. Cir. 2002) (“The ordinary meaning of ‘contain’ is ‘to have within.’” (citing dictionary)).]

Ciena at 21–22.

In IPR proceedings, the patentee distinguished references as lacking a laser. *See* Dkt. No. 62-9 at 51 (arguing that Petitioners did not “address[] the requirement of placing a laser on the claimed ‘transceiver card’”); *see also id.* at 50–52; Dkt. No. 62-10 at 28 (in the “Ade” reference, the “transmitter does not include a light source and Ade does not disclose a light source on a transceiver card”); Dkt. No. 62-10 at 22 (“Ade fails to teach or suggest modifying a transmitter to include a light source on the same transceiver card as the transmitter.”); Dkt. No. 62-11 at 41–43 (similar); Dkt. No. 62-12 at 31–33 (similar); Dkt. No. 62-13 at 34–35 (similar).

Also, the PTAB construed “a transmitter having a laser” to mean “a transmitter holding, including, or containing a laser.” Dkt. No. 62-15 at 18–19 (“A pertinent dictionary definition of ‘having’ is ‘to hold, include, or contain as a part or whole <the car *has* power brakes> <April *has* 30 days>.’ *Webster’s Tenth Collegiate Dictionary* 533 (1998) [] (emphases in original). Therefore, with this definition, a transmitter having a laser would hold, include, or contain the laser.”; instituting IPR as to the ’898 Patent); Dkt. No. 62-14 at 9 (“All three claims 1, 14, and 25 require a laser within the transmitter itself and also an energy level detector on the same card as the transmitter”; denying institution of IPR as to ancestor U.S. Pat. No. 7,620,327). The PTAB also

relied on the above-discussed disclosure of structures that “define a transmitter.” Dkt. No. 62-15 at 18 (citing ’898 Patent at 1:25–32, 4:32–34).³

This interpretation by the PTAB is not binding on this Court but is persuasive when considered in light of the claim language and the above-discussed intrinsic evidence, particularly given that *Ciena* reached a similar conclusion.

At the April 23, 2021 hearing, Plaintiff alternatively proposed construing the disputed term as “a transmitter having, including, or containing as a part or as a whole . . .” or as “a transmitter containing, in whole or in part . . .” The *Ciena* analysis rejected such formulations but nonetheless expressed some flexibility, stating that “to the extent that some parts of the transmitter may extend beyond its boundaries, they must still be *substantially* ‘contained’ by the transmitter to constitute the same component.” *Ciena* at 22 (emphasis added). In response to discussion of this portion of *Ciena* at the April 23, 2021 hearing, Defendant alternatively submitted that if the Court wishes to modify the construction, then the disputed term could be construed as “a transmitter *substantially* containing a laser, a modulator, and a controller.”

Thus, based on the foregoing and in light of the analysis set forth in *Ciena*, the Court “substantially” adopts the *Ciena* construction and hereby construes **“a transmitter having a laser, a modulator, and a controller”** to mean **“a transmitter substantially containing a laser, a modulator, and a controller.”**

C. “output data”

Plaintiff’s Proposed Construction	Defendant’s Proposed Construction
“data outputted by the receiver”	“the data encoded in the second optical signal and outputted by the receiver”

³ This is also consistent with the patentee’s statement in IPR proceedings regarding ancestor U.S. Pat. No. 7,620,327 that “Ade clearly discloses that the light source is *external to the transmitter.*” Dkt. No. 62-12 at 32 (emphasis in original).

Dkt. No. 56 at 3; Dkt. No. 61 at 14; Dkt. No. 62 at 21; Dkt. No. 63 at 7; Dkt. No. 67-1 at 5, 8. The parties submit that this term appears in Claims 1 and 14 of the '898 Patent. Dkt. No. 61 at 14; Dkt. No. 62 at 21; Dkt. No. 63 at 7.

Shortly before the start of the April 23, 2021 hearing, the Court provided the parties with the following preliminary construction: "data, outputted by the receiver, that was encoded in the second optical signal." At the hearing, both sides agreed with the Court's preliminary construction.

The Court therefore hereby construes "**output data**" to mean "**data, outputted by the receiver, that was encoded in the second optical signal.**"

D. "input data"

Plaintiff's Proposed Construction	Defendant's Proposed Construction
"data inputted to the transmitter"	"the data inputted to the transmitter and encoded in the first optical signal"

Dkt. No. 56 at 3; Dkt. No. 61 at 16; Dkt. No. 62 at 21; Dkt. No. 63 at 9; Dkt. No. 67-1 at 5–6, 8. The parties submit that this term appears in Claims 1 and 14 of the '898 Patent. Dkt. No. 61 at 16; Dkt. No. 62 at 21; Dkt. No. 63 at 9.

Shortly before the start of the April 23, 2021 hearing, the Court provided the parties with the following preliminary construction: "data inputted to the transmitter." At the hearing, both sides agreed with the Court's preliminary construction.

The Court accordingly hereby construes "**input data**" to mean "**data inputted to the transmitter.**"

VI. DISPUTED TERMS IN U.S. PATENT NO. 10,205,516

E. “voltage”

Plaintiff’s Proposed Construction	Defendant’s Proposed Construction
Plain and ordinary meaning, or, in the alternative, “difference in electrical potential expressed in volts.”	“electric pressure that causes current to flow in a circuit”

Dkt. No. 56 at 3; Dkt. No. 61 at 18; Dkt. No. 62 at 23; Dkt. No. 63 at 9; Dkt. No. 67-1 at 9–10.

Plaintiff submits that this term appears in Claims 1, 8, 12, 17, 19, and 21 of the ’516 Patent. Dkt. No. 61 at 18; Dkt. No. 63 at 9. Defendant submits that this term appears in Claim 1 of the ’516 Patent. Dkt. No. 62 at 23.

Shortly before the start of the April 23, 2021 hearing, the Court provided the parties with the following preliminary construction: “difference in electrical potential, which can be measured in volts.” At the hearing, both sides agreed with the Court’s preliminary construction.

The Court therefore hereby construes “**voltage**” to mean “**difference in electrical potential, which can be measured in volts.**”

VII. CONCLUSION

The Court adopts the constructions set forth in this opinion for the disputed terms of the patents-in-suit. The parties are ordered that they may not refer, directly or indirectly, to each other’s claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the Court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

SIGNED this 4th day of May, 2021.


 ROY S. PAYNE
 UNITED STATES MAGISTRATE JUDGE

APPENDIX A

<u>Term (and relevant asserted claims identified by the parties)</u>	<u>Parties' Agreed-Upon Construction</u>
United States Patent No. 8,913,898	
“phase modulate” and grammatical variants / “phase modulator” (Claims 3, 17)	“alter the phase of light to create an optical signal having a phase that is representative of data. Use of phase modulation excludes the use of amplitude modulation.”
“phase modulated optical signal” (Claims 4, 18)	
“phase-modulated signal” (Claim 10)	
“receiver” (Claims 1, 14)	“receiver without a demodulator”
“the second optical signal”	“a second optical signal” is antecedent for “the second optical signal”
United States Patent No. 10,205,516	
“receiver”	“receiver without a demodulator”
“phase modulate” and variants; “phase modulated optical data signal” (Claim 6)	“alter the phase of light to create an optical signal having a phase that is representative of data. Use of phase modulation excludes the use of amplitude modulation.”

Dkt. No. 56 at 1; Dkt. No. 61 at 18 n.5; Dkt. No. 67-1 at 5–9, 11; *see* Dkt. No. 56 at 3.